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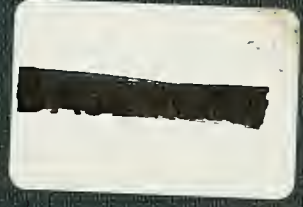

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The U.S. Current Account and the Dollar

Olivier Blanchard Francesco Giavazzi Filipa Sa *

January 26, 2005

Abstract

There are two main forces behind the large U.S. current account deficits. First, an increase in the U.S. demand for foreign goods. Second, an increase in the foreign demand for U.S. assets.

Both forces have contributed to steadily increasing current account deficits since the mid–1990s. This increase has been accompanied by a real dollar appreciation until late 2001, and a real depreciation since. The depreciation has accelerated recently, raising the questions of whether and how much more is to come, and if so, against which currencies, the euro, the yen, or the renminbi.

Our purpose in this paper is to explore these issues. Our theoretical contribution is to develop a simple portfolio model of exchange rate and current account determination, and to use it to interpret the past and explore alternative scenarios for the future. Our practical conclusions are that substantially more depreciation is to come, surely against the yen and the renminbi, and probably against the euro.

* MIT and NBER, MIT, NBER, CEPR and Bocconi, and MIT respectively. Prepared for the AEA meetings, January 2005. We thank Ricardo Caballero, Pierre Olivier Gourinchas and Ken Rogoff for comments.

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There are two main forces behind the large U.S. current account deficits:

First, an increase in the U.S. demand for foreign goods, partly because of relatively higher U.S. growth, partly because of shifts in demand away from U.S. goods towards foreign goods.

Second, an increase in the foreign demand for U.S. assets, starting with high foreign private demand for U.S. equities in the second half of the 1990s, shifting to foreign private and then central bank demands for U.S. bonds in the 2000s.

Both forces have contributed to steadily increasing current account deficits since the mid–1990s. This increase has been accompanied by a real dollar appreciation until late 2001, and a real depreciation since. The depreciation has accelerated recently, raising the questions of whether and how much more is to come, and if so, against which currencies, the euro, the yen, or the renminbi.

Our purpose in this paper is to explore these issues. Our contribution is to develop a simple portfolio model of exchange rate and current account determination, and to use it to interpret the past and explore the future.

Section 1 presents a two-country model, with the United States and the rest of the world as the two countries. The model is based on the twin assumptions of imperfect substitutability both between U.S. and foreign goods, and between U.S. and foreign assets. This allows us to characterize the effects of both goods and portfolio shifts.

The model is easy to calibrate and provides a convenient way to look at and organize the facts. We do so in Section 2, and take a first pass at the size of the required dollar depreciation.

Section 3 characterizes the dynamics of the model, and focuses on the effects of shifts in relative demand away from U.S. goods, and of shifts in relative demand towards U.S. assets. The first imply a steady depreciation of the

dollar. The second imply an initial appreciation followed by a depreciation, to a level lower than before the shift. The United States appears to have entered the depreciation phase. The model again provides a convenient way of thinking about magnitudes and eventual outcomes.

Our analysis suggests that, in the absence of unexpected events, more depreciation is to come. Can things turn out better or worse? Many scenarios have been discussed, from the potential role of higher U.S. interest rates to slow/stop the depreciation, to the implications of shifts in portfolio preferences from U.S. to euro bonds, to changes in the composition of reserves of Asian central banks, to the floating of the renminbi. We discuss these scenarios in Section 4. Section 5 concludes.

1 A Portfolio Balance Model of the Current Account

Our model starts from the assumptions that both U.S. and foreign goods, and U.S. and foreign assets, are imperfect substitutes. Assuming imperfect substitutability in both goods and asset markets allows us to think about and trace the effects of shifts in preferences for goods and in preferences for assets.

The model builds on two old (largely and unjustly forgotten) papers, by Henderson and Rogoff [1982], and, especially, Kouri [1983].[1] Both papers relax the interest parity condition and assume instead imperfect substitutability of domestic and foreign assets. Henderson and Rogoff focus mainly on issues of stability. Kouri focuses on the effects of changes in portfolio preferences and the implications of portfolio balance for current

1. The working paper version of the paper by Kouri dates from 1976. One could argue that there were two fundamental papers written that year on this issue, one by Dornbusch [1976], who explored the implications of perfect substitutability, the other by Kouri, who explored the implications of imperfect substitutability. The Dornbusch approach, and its powerful implications, has dominated research since then. But imperfect substitutability seems central to the issues we face today.

account shocks. Our value added is in allowing for a richer description of gross asset positions. This allows us to analyze valuation effects, which have been at the center of recent empirical research on gross financial flows—in particular by Gourinchas and Rey [2004] and Lane and Milesi–Ferretti [2004]—, and play an important role in the context of U.S. current account deficits.

1.1 Assumptions

We consider two countries, the United States—the "domestic country"—and the rest of the world—the "foreign country."

- Let X denote U.S. assets, expressed in terms of U.S. goods. Let W denote U.S. wealth, also in terms of U.S. goods. Let F denote the U.S. net debt position vis a vis the rest of the world, again in terms of U.S. goods. Then, by definition

$$F = X - W$$

- Similarly, let X^* denote foreign assets, in terms of foreign goods (stars denote foreign variables). Let W^* denote foreign wealth, in terms of foreign goods. Let E denote the exchange rate, defined as the price of U.S. goods in terms of foreign goods. It follows that:

$$F = W^*/E - X^*/E$$

- Let the gross rate of return on U.S. assets, in terms of U.S. goods, be given by $(1+r)$. Let the gross rate of return on foreign assets, in terms of foreign goods, be given by $(1+r^*)$, so the expected gross rate of return on foreign assets in terms of U.S. goods is $(1+r^*)E/E'^e$. (Primes denote values of a variable next period, and e stands for

expected.) The relative expected gross rate of return on holding U.S. assets versus foreign assets, R, is therefore given by

$$R \equiv \frac{1+r}{1+r^*}\frac{E'^e}{E} \tag{1}$$

- U.S. investors allocate their wealth W between U.S. and foreign assets. We assume that they allocate a share α to U.S. assets, and by implication a share $(1-\alpha)$ to foreign assets. Symmetrically, we assume that foreign investors invest a share α^* of their wealth W^* in foreign assets, and a share $(1-\alpha^*)$ in U.S. assets.
  We assume that the shares are functions of the relative gross rate of return, so

$$\alpha = \alpha(R), \;\; \alpha_R > 0 \qquad \alpha^* = \alpha^*(R), \;\; \alpha^*_R < 0$$

  A higher rate of return on U.S. assets increases the U.S. share in U.S. assets, and decreases the foreign share in foreign assets.
  An important parameter in the model is the degree of home bias in U.S. and foreign portfolios. We assume that there is indeed home bias, and capture it by assuming

$$\alpha(1) > \frac{X}{X + X^*/E} \qquad \alpha^*(1) > \frac{X^*/E}{X + X^*/E}$$

- U.S. and foreign goods are imperfect substitutes, and the excess of U.S. imports over U.S. exports, the U.S. trade deficit, in terms of U.S. goods is given by

$$D = D(E, z), \;\; D_E > 0, \;\; D_z > 0$$

  The condition $D_E > 0$ is the Marshall Lerner condition. z stands for any variable that increases the U.S. trade deficit at a given real

exchange rate. These may be either changes in U.S. or foreign levels of activity, or shifts in U.S. or foreign relative demands at a given exchange rate and given activity levels.

1.2 Portfolio Balance

Equilibrium in the market for U.S. assets (and by implication, in the market for foreign assets) implies

$$X = \alpha(R)\, W + (1 - \alpha^*(R))\, \frac{W^*}{E}$$

The given supply of U.S. assets must be equal to U.S. demand plus foreign demand. Given the definition of F introduced earlier, this condition can be rewritten as

$$X = \alpha(R)(X - F) \; + \; (1 - \alpha^*(R))\, (\frac{X^*}{E} + F) \tag{2}$$

where R is given in turn by equation (1), and depends in particular on E and E'^e.

This gives us our first relation, which we shall refer to as the **portfolio balance** relation, between net debt, F and the exchange rate, E. The slope of the relation between net debt and the exchange rate, evaluated at $r = r^*$ and $E'^e = E$ so $R = 1$, is given by

$$\frac{dE}{dF} = -\frac{\alpha(1) + \alpha^*(1) - 1}{(1 - \alpha^*(1))X^*/E^2} < 0$$

So, in the presence of home bias, higher net debt must be associated with a lower exchange rate. The reason is that, as wealth is transfered from the United States to the rest of the world, home bias leads to a decrease in the

demand for U.S. assets, which in turn requires a decrease in the exchange rate.

1.3 Current Account Balance

Turn now to the equation giving the dynamics of the U.S. net debt position. Given our assumptions, U.S. net debt next period, F', is given by

$$F' = (1 - \alpha^*(R))\ \frac{W^*}{E}\ (1 + r) - (1 - \alpha(R))\ W\ (1 + r^*)\frac{E}{E'}\ +\ D(E')$$

Net debt next period is equal to next period's value of U.S. assets held by foreign investors, minus next period's value of foreign assets held by U.S. investors, plus next period's trade deficit:

- The value of U.S. assets held by foreign investors next period is equal to their wealth in terms of U.S. goods this period W^*/E, times the share they invest in U.S. assets, $(1 - \alpha^*)$, times the gross rate of return on U.S. assets in terms of U.S. goods.
- The value of foreign assets held by U.S. investors next period is equal to U.S. wealth this period, W, times the share invested in foreign assets $(1 - \alpha)$, times the (realized) gross rate of return on foreign assets in terms of U.S. goods, $(1 + r^*)E/E'$.

The previous equation can be rewritten as

$$F' = (1 + r)F + (1 - \alpha(R))(1 + r)(1 - \frac{1 + r^*}{1 + r}\frac{E}{E'})(X - F) + D(E') \quad (3)$$

We shall call this the **current account balance relation.**

The first and last terms on the right are standard: Next period net debt is equal to this period net debt times the gross rate of return, plus the trade deficit next period.

The term in the middle reflects valuation effects, recently stressed by Gourinchas and Rey [2004], and Lane and Milesi–Ferretti [2004]. Consider for example an unexpected decrease in the price of U.S. goods, an unexpected decrease in E' relative to E—a dollar depreciation for short.[2] This depreciation increases the dollar value of U.S. holdings of foreign assets. Put another way, a depreciation improves the net debt position in two ways, the conventional one through the improvement in the trade balance, the second through asset revaluation. Note that:

- The strength of the valuation effects depends on gross rather than net positions, and so on the share of the U.S. portfolio in foreign assets, $(1-\alpha)$, and on the size of U.S. wealth, $X-F$. It is present even if $F=0$.
- The strength of valuation effects depends on our assumption that U.S. gross liabilities are denoted in dollars, and so their value in dollars are unaffected by a dollar depreciation. Valuation effects would obviously be very different when, as is typically the case for emerging countries, gross positions were smaller, and liabilities were denominated in foreign currency.
- We have focused on the effects of an unexpected depreciation. Note however that a period of anticipated depreciation, if foreigners are willing to hold U.S. assets at a lower rate of return, will achieve the same result, but do so over time. We shall return to this issue when characterizing dynamics later.

In steady state, equation (3) reduces to the simpler

$$0 = rF + (1-\alpha(R))(r-r^*)(X-F) + D(E,z) \tag{4}$$

The current account deficit, which is equal to interest payments on the net

2. Throughout the paper, we use "dollar depreciation or appreciation" to refer to a real depreciation or real appreciation.

debt position, plus the interest rate differential on the gross position, plus the trade deficit, has to be equal to zero.

This relation implies a negative relation between net debt and the exchange rate in steady state: Higher net debt implies larger interest payments, and therefore a larger trade surplus to achieve current account balance. This larger trade surplus must be achieved through a lower exchange rate.

1.4 External and Internal Balance

An additional condition must hold in equilibrium, namely that the U.S. trade deficit be equal to minus U.S. saving (with a similar condition holding for the foreign country.)[3] Write this condition as:

$$D(E, z) = -S(r, .) \tag{5}$$

where saving is taken to be a function of the interest rate, r, and other unspecified factors, from activity levels, to wealth, to budget deficits.

Introducing a fully specified saving function, and using this additional condition would allow us to solve for the path of the exchange rate, the current account, and the interest rates in response to shocks. We take instead a short cut, and take r and r^* as given in equations (1), (2) and (3).[4] By taking interest rates as fixed, we are implicitly making one of two assumptions: The first is that saving adjusts through changes in the level of activity, along standard Keynesian lines. The second is that the government takes

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3. There is no investment in our model.

4. Henderson and Rogoff take the other route, specifying a saving function, and using (5). To keep their analysis tractable however, they simplify the rest of the model by assuming perfect substitutability of domestic and foreign goods, so the real exchange rate is constant. Given our interest in understanding movements in the U.S. real exchange rate, we prefer not to endogenize interest rates, and allow for imperfect substitutability between U.S. and foreign goods.

measures to adjust saving as the trade deficit changes—for example by reducing the fiscal deficit as the trade deficit is reduced—so as to maintain output at its natural level. Given the span of time over which the dynamics take place, we prefer the second of the two interpretations.

This may be the place to make a point sometimes overlooked in today's discussions of the current account deficit.[5] To reduce the trade deficit while maintaining stable output, the depreciation must come with other measures which increase domestic saving, such as a decrease in budget deficits. In other words, equation (5) has to hold. These other measures however have to come in addition to the depreciation. The statement that a reduction in budget deficits reduces or eliminates the need for depreciation is obviously incorrect.

2 Turning to Numbers

Before moving to dynamics, it is useful to get a sense of magnitudes for the various parameters of the model, and look at some of their implications.

- In 2003, U.S. financial wealth, W, was equal to \$35 trillion. Non–U.S. world financial wealth is harder to assess. Based on a ratio of financial assets to GDP of about 2 for Japan and Europe, and a GDP for non–U.S. world of approximately \$18 trillion in 2003, a reasonable estimate for W^*/E is \$36 trillion—so about the same as for the United States.

- In 2003, F, net U.S. debt, at market value, was equal to \$2.7 trillion, up from approximate balance in the early 1990s. By implication, U.S. assets, X, were equal to $W + F = \$35 + \$2.7 = \$37.7$ trillion.

5. A similar point is emphasized by Obstfeld and Rogoff [2004].

Foreign assets, X^*/E, were equal to $W^*/E - F = \$36 - \$2.7 = \$33.3$ trillion.

Put another way, the ratio of U.S. net debt to U.S. assets, F/X, was $2.7/(35+2.7) = 7.1\%$; the ratio of U.S. net debt to U.S. GDP was equal to $2.7/11 = 25\%$.

- In 2003, U.S. holdings of foreign assets, at market value, were equal to \$8.0 trillion. Together with the value for W, this implies that the share of U.S. wealth in U.S. assets, α, was equal to $1 - (8.0/35) = 0.77$. Foreign holdings of U.S. assets, at market value, were equal to \$10.7 trillion. Together with the value of W^*/E, this implies that the share of foreign wealth in foreign assets, α^*, was equal to $1 - (10.7/36) = 0.70$.

  To get a sense of the implications of these values for α and α^*, note, from equation (2) that a transfer of one dollar from U.S. wealth to foreign wealth implies a decrease in the demand for U.S. assets of $(\alpha + \alpha^* - 1)$ dollars, or 47 cents.[6]

  As current account deficits are leading to a steady increase in F, this estimate implies, other things equal, a steady decrease in the demand for U.S. assets. This will play a role in the dynamic adjustment we describe in the next section.

Table 1 summarizes the values derived above.

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6. Note that this conclusion is dependent on the assumption we make in our model that marginal and average shares are equal. This may not be the case.

Table 1. Wealth, Assets, and Shares

W	W^*/E	X	X^*/E	F	α	α^*
\$35	\$36	\$37.5	\$34.5	\$2.7	0.77	0.70

$W, W^*/E, X, X^*/E, F$ are in trillions of dollars

The other important coefficient is the effect of the exchange rate on the trade balance. Define θ as the derivative of the ratio of the trade balance to GDP with respect to a proportional change in the real exchange rate, $\theta \equiv (dD/\text{Exports})/(dE/E)$. Then, starting from initial trade balance

$$\theta = (\eta_{\text{im}} - \eta_{\text{exp}} - 1)$$

where η_{im} and η_{exp}'s are the import and export elasticities with respect to the real exchange rate.

Estimates based on estimated U.S. import and export equations range quite widely (see the survey by Chinn [2002]). In some cases, the estimates imply that the Marshall–Lerner condition (the condition that θ be positive, so a depreciation improves the trade balance) is barely satisfied. Estimates used in macroeconometric models imply a value of θ between 0.5 and 0.9.[7] Put another way, together with the assumption that the ratio of exports to GDP is equal to 10%, they imply that a reduction of the ratio of the trade deficit to GDP of 1% requires a depreciation somewhere between 11 and 20%.

One may believe however that measurement error, complex lag structures, and mispecification all bias these estimates downwards. An alternative ap-

7. The estimates by Hooper et al [2001] ($\eta_{\text{exp}} = -1.5$ and $\eta_{\text{imp}} = 0.3$), are representative.

proach is to derive the elasticities from plausible specifications of utility, and of pass-through behavior of firms. Using such an approach, and a model with non tradable goods, tradable domestic goods, and foreign tradable goods, Obstfeld and Rogoff [2004] find that a decrease in the trade deficit to GDP of 1% requires a decrease in the real exchange rate somewhere between 7% and 10%—thus, a smaller depreciation than implied by macroeconometric models.

Which value to use is obviously crucial to assess the scope of the required exchange rate adjustment. We choose an estimate of 0.7 for θ—towards the high range of empirical estimates, but substantially lower than the Obstfeld Rogoff elasticities. This estimate, together with an export ratio of 10%, implies that a reduction of the ratio of the trade deficit to GDP of 1% requires a depreciation of 15%.

The Required Dollar Depreciation: A First Pass

With these parameters, we can do a simple exercise—computing the depreciation that would be needed to achieve current account balance, given today's foreign indebtdness.

Consider the effects of a depreciation of the dollar of 15%. Given our choice of θ, and absent valuation effects, the effect of such depreciation is to reduce the ratio of the trade deficit to GDP by 1%.

This ignores valuation effects however. If the depreciation is unexpected, its effect is to increase the value of U.S. holdings of foreign assets by 15%. This implies a decrease in the ratio of net debt to GDP of 15% times $(1-\alpha)(X-F)/Y$ or about 10%. If we assume a rate of return on assets of 4%, this decrease in net debt implies a reduction in interest payments, in terms of U.S. goods, of 0.4% of GDP. Adding the trade balance and valuation effects implies that an unexpected depreciation improves the current

account balance by 1.4%.[8]

Now consider a rough characterization of the U.S. position: A trade deficit of 5% of GDP, a ratio of net debt to GDP of 25%, an interest rate of 4%, and so a current account deficit of 6%. We can ask what depreciation would be required to eliminate the current account deficit today:

Ignoring valuation effects—and ignoring also the non–linearities present in the model; these non–linearities lead to even larger estimates of the required depreciation—achieving current account balance would require a trade surplus of 1%, and so a dollar depreciation of 15 times 6% = 90%.

Taking into account valuation effects, and assuming that the depreciation is unexpected, the required depreciation is "only" 65%: The trade deficit is still positive, equal to 0.7% of GDP. But the depreciation shifts the United States from being a net debtor to being a net creditor, and so, net interest payments are enough to offset the trade deficit.

90% or even 65% are very large numbers. They must be qualified in at least two ways:

- Despite positive U.S. net debt in 2003, payments from the rest of the world actually exceeded payments from the United States to the rest of the world. (Transfers, not interest payments, were the reason why the current account deficit was higher than the trade deficit.) This reflects the fact that r was less than r^*, leading to smaller payments on foreign holdings of U.S. assets than on U.S. holdings of foreign assets—the second term in equation (5). Our parameters imply that for each 1% decrease in r below r^*, the ratio of net interest payments to GDP decreases by 1% times $(1 - \alpha)W/Y$%, or 0.75%. If we assume that the interest differential observed in the

8. A similar computation is given by Lane and Milesi-Ferretti [2004] for a number of countries, although not for the United States.

recent past was anticipated, and that U.S. assets will continue to pay 1% less than foreign assets in the future, this requires 8% less depreciation of the dollar to achieve current account balance.

- Growth is equal to zero in our model, so the current account has to be balanced in steady state. As Ventura [2003] has argued however, in the presence of growth, allowing the U.S. to maintain a constant ratio of net debt to GDP allows for a current account deficit in steady state, and so requires a smaller adjustment than implied by the computation above. It is straightforward to extend our computation to allow for growth. A growth rate of 4% and a constant ratio of net debt to GDP of 25% allows for a current account deficit of 1.0% of GDP. This further reduces the required depreciation by another 10%.

Putting the different estimates together gives depreciation rates ranging from 90% to about 40%, starting roughly from today's level.[9]

These are very large numbers. There is however no likelihood—and indeed no need—for such a current account adjustment to take place overnight. It can and will clearly take place over time; however as time passes, F will increase, and so will the size of the required adjustment. This takes us to dynamics.

3 Steady state, Dynamics, and Shifts

To present and discuss the dynamic response to shocks in the model, the easiest way is to take the continuous time limit of our two equations and use a phase diagram. Also for simplication, in this section, we assume

9. Yet another adjustment should reflect that the current trade deficit numbers show the adverse J–curve effects of the dollar depreciation over the last two years. We have not estimated it yet.

$r = r^*$; we shall return to the role of interest rate differentials in discussing scenarios later on. (For the readers uninterested in technical details, the main conclusions are stated at the end of the subsection on goods and assets preference shifts.)

3.1 Equilibrium and Dynamics

In continuous time, the portfolio and current account balance equations become:

$$X = \alpha(1 + \frac{\dot{E}^e}{E})\,(X - F) + (1 - \alpha^*(1 + \frac{\dot{E}^e}{E}))\,(\frac{X^*}{E} + F)$$

$$\dot{F} = rF + (1 - \alpha(1 + \frac{\dot{E}^e}{E}))\,\frac{\dot{E}}{E}\,(X - F) + D(E)$$

Note the presence of both expected and actual depreciation in the current account balance relation. Expected appreciation determines the share of the U.S. portfolio put in foreign assets; actual appreciation determines the change in the value of that portfolio, and in turn the change in the U.S. net debt position.

The equilibrium and local dynamics are characterized in Figure 1.[10]

The locus ($\dot{E} = \dot{E}^e = 0$) is obtained from the portfolio balance equation, and is downward sloping: In the presence of home bias, an increase in net debt shifts wealth abroad, decreasing the demand for U.S. assets, and requiring a depreciation.

The locus ($\dot{F} = 0$) is obtained by assuming ($\dot{E}^e = \dot{E}$) in the current account balance ration, and replacing ($\dot{E}^e$) by its implied value in the portfolio

10. We have not yet fully characterized global dynamics. The non lincarities imbedded in the equations imply that the economy is likely to have two equilibria, one of them saddle point stable. This is the equilibrium we focus on.

balance equation. This locus is also downward sloping: A depreciation leads to a smaller trade deficit, and thus allows for a larger net debt position consistent with current account balance.

The condition for the equilibrium to be saddle point stable is that the locus ($\dot{F} = 0$) be flatter than the ($\dot{E} = 0$) locus. For this to hold, the following condition must be satisfied:

$$\frac{r}{D_E} < \frac{\alpha + \alpha^* - 1}{(1 - \alpha^*)X^*/E^2}$$

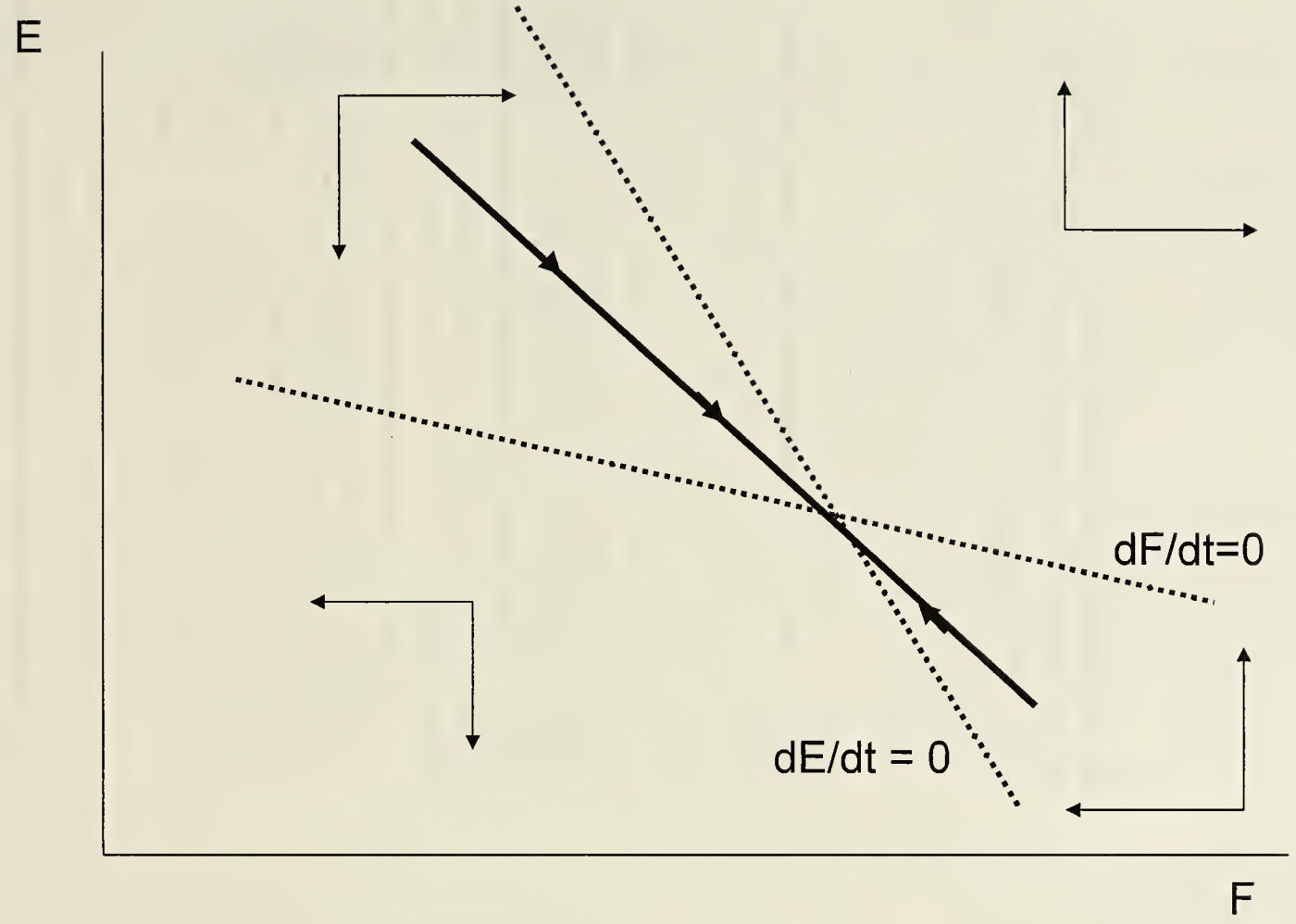
This condition has a simple and intuitive interpretation. Consider the effects of an increase in U.S. net debt F:

- On the one hand, the increase in F increases interest payments on the debt. This increase in interest payments leads to a deterioration of the current account.
- On the other hand, the increase in F leads to a decrease in the demand for U.S. assets, and so to a depreciation. This depreciation leads in turn to an improvement in the trade balance, and so to an improvement in the current account.

The condition above is the condition that the net result of these two effects on the current account be positive, so an increase in net debt reduces the current account deficit. It is more likely to be satisfied, the smaller the interest rate, and the larger the response of the trade balance to the exchange rate.

We assume this condition to be satisfied in what follows. In that case, the equilibrium is as in Figure 1. The relation ($\dot{E} = 0$) is downward sloping. The relation ($\dot{F} = 0$) is also downward sloping and flatter. The dynamics are as indicated in the figure. The saddle point path is downward sloping. Starting from net debt below the steady state level, net debt increases, and the exchange rate decreases.

Figure 1. Adjustment of the exchange rate and the net debt position.



The steady state values of F and E are given by:

$$X = \alpha(1)\,(X - F) + (1 - \alpha^*(1))\,(\frac{X^*}{E} + F)$$

$$0 = rF + D(E)$$

Supply and demand for U.S. assets must be equal, at a given relative return equal to one. And the current account deficit, i.e the sum of interest payments on net debt and the trade deficit, must be equal to zero.

Note that the steady state is independent of the elasticities of α and α^* with respect to the relative return. But these elasticities have an important effect on the position of the saddle point path, and in turn on the dynamics of adjustment (the implications will be clear when we look at shifts below).

The two elasticities do not affect the slope of the $\dot{E} = 0$ locus. They do however affect the slope of the $\dot{F} = 0$, and by implication the slope of the saddle point path:

- The smaller the two elasticities, the closer the locus ($\dot{F} = 0$) is to the ($\dot{E} = 0$), and the closer the saddle point path is to the ($\dot{E} = 0$). In the limit, if the degree of substitutability between U.S. and foreign assets is equal to zero and the shares are invariant, the two loci (and the saddle point path) coincide, and the economy remains on and adjusts along the ($\dot{E} = 0$), the portfolio balance relation.
- The larger the two elasticities, the closer the ($\dot{F} = 0$) locus is to the locus given by $0 = rF + D(E)$, and the closer the saddle point path is to that locus as well. The larger the elasticities, the slower the adjustment of F and E over time. The slow adjustment of F comes from the fact that we are close to current account balance. The slow adjustment of E comes from the fact that, the larger the elasticities,

the smaller is $\dot{E}$ for a given distance from the $\dot{E} = 0$ locus.
The limiting case of perfect substitutability is degenerate in our model. The speed of adjustment goes to zero. The economy is always on the locus $0 = rF + D(E)$. For any level of net debt, the exchange rate adjusts so net debt remains constant, and, in the absence of shocks, the economy stays at that point. There is no steady state, and where the economy is depends on history.

3.2 Goods and Assets Preference Shifts

Figures 2a and 2b show the dynamic effects of the two types of shifts we believe have dominated the evolution of the current account and the dollar over the last ten years.

Figure 2a shows the effect of an (unexpected) increase in z, so for a given exchange rate, the trade deficit is now larger. One can think of z as coming either from increases in U.S. activity relative to foreign activity, or from a shift in exports or imports at a given level of activity and a given exchange rate; we defer a discussion of the sources of the actual shift in z over the past decade in the United States to the next section.

The implication is a downward shift of the $(\dot{F} = 0)$ locus, and so a downward shift of the saddle point path. At the time of the shift, valuation effects imply that any unexpected depreciation leads to an unexpected decrease in the net debt position. Denoting by ΔE the unexpected change in the exchange rate at the time of the shift, it follows from equation (3) that the relation between the two at the time of the shift is given by:

$$\Delta F = (1 - \alpha)(X - F)\frac{\Delta E}{E} \tag{6}$$

The economy jumps initially from A to B, and then converges over time along the saddle point path, from B to C. The shift in the trade deficit leads

Figure 2a. Adjustment of the exchange rate and the net debt position to a shift in the trade deficit.

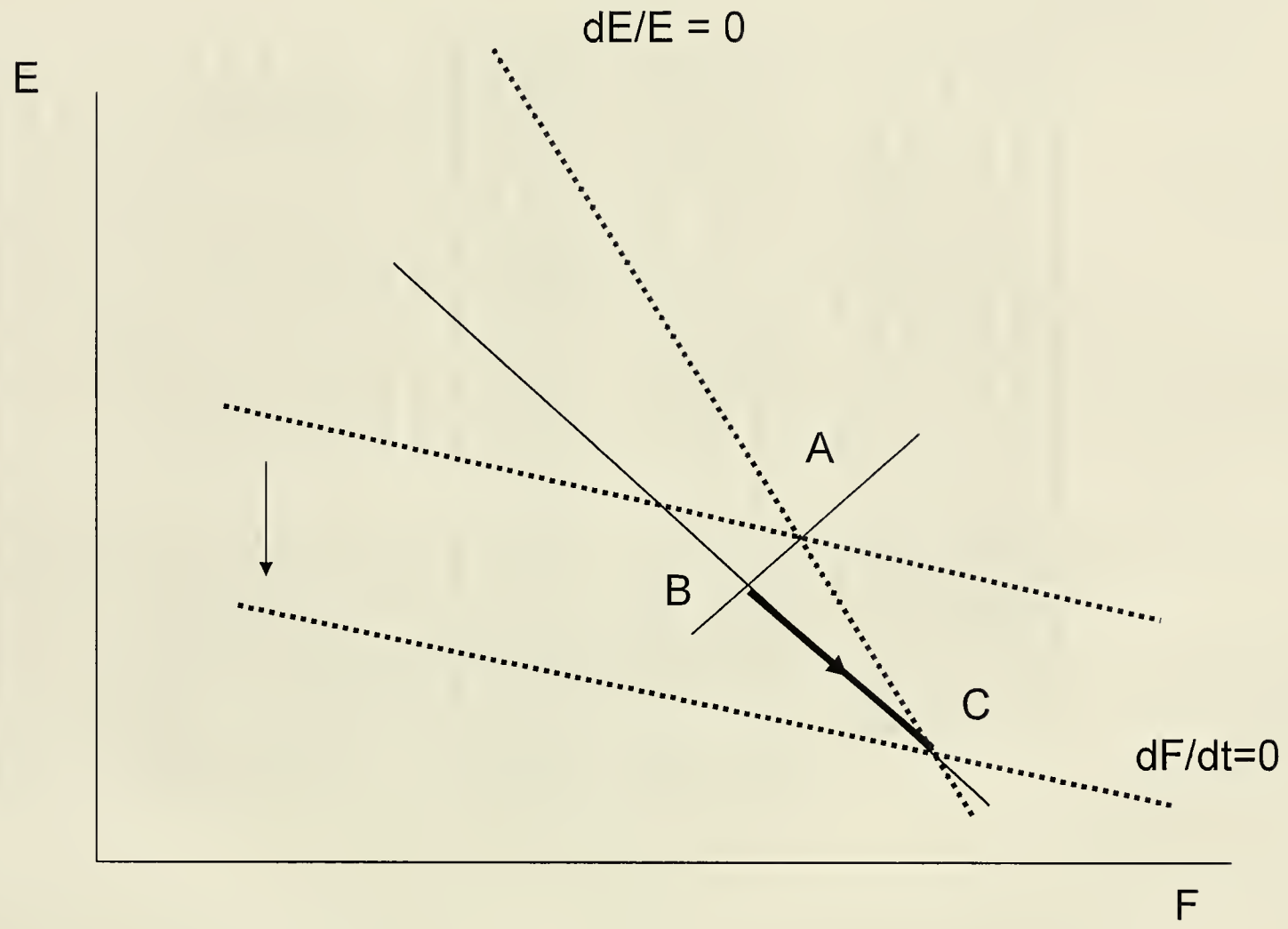
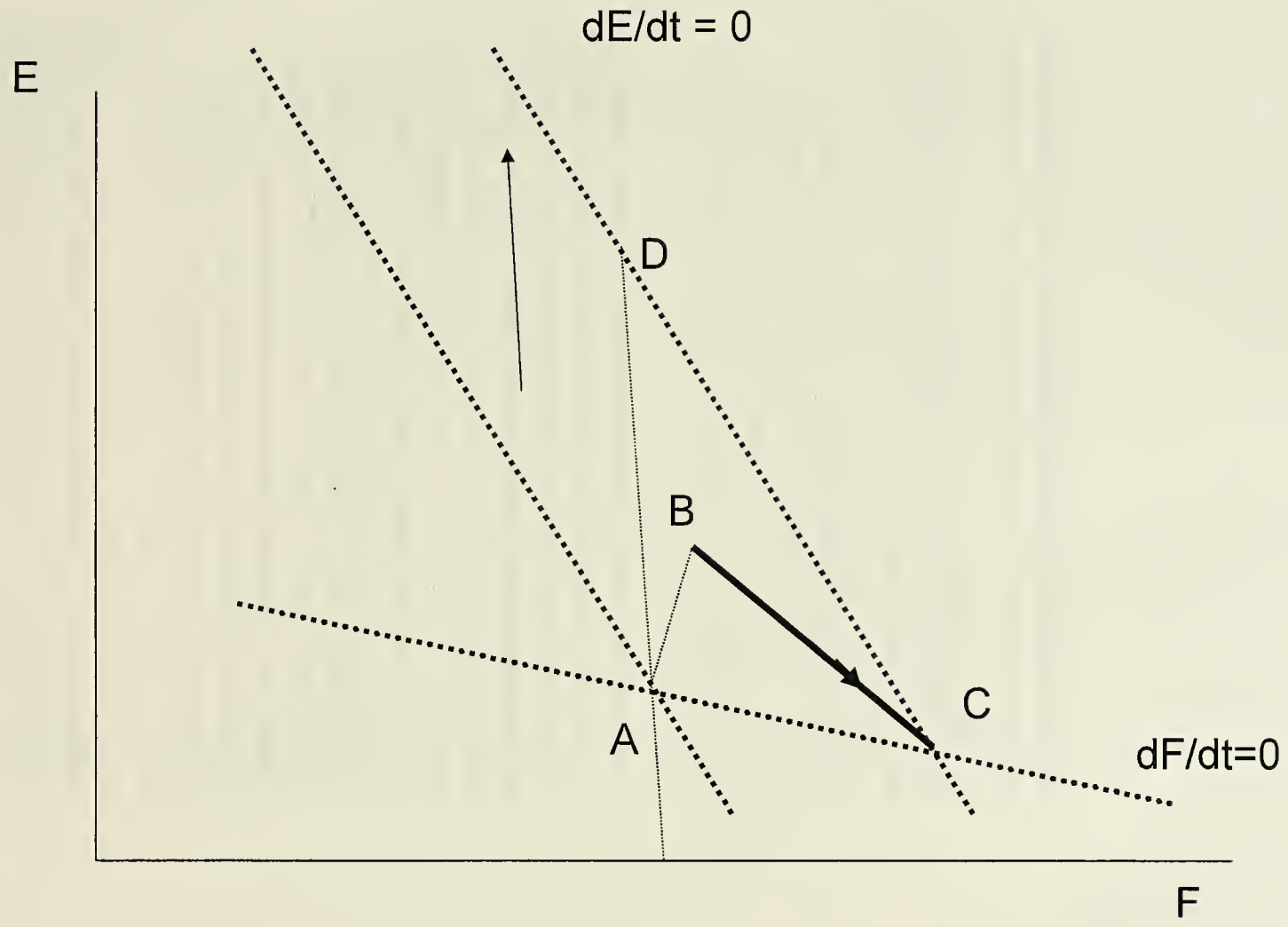


Figure 2b. Adjustment of the exchange rate and the net debt position to a portfolio shift towards U.S. assets



to an initial, unexpected, depreciation, followed by further depreciation over time and net debt accumulation until the new steady state is reached.

The degree of imperfect substitutability plays an important role in the nature of the adjustment, and in the respective roles of the initial unexpected depreciation, and the anticipated depreciation thereafter. The less substitutable U.S. and foreign assets are, the closer the saddle point path to the $\dot{E} = 0$ locus, the smaller the initial depreciation, and the larger the anticipated rate of depreciation thereafter. The more substitutable U.S. and foreign assets are, the closer the saddle point path is to the locus $0 = rF - D(E)$, the larger the initial depreciation, the smaller the anticipated rate of depreciation thereafter.[11]

Figure 2b shows the effect of an (unexpected) increase in the demand for U.S. assets, coming for example from an increase in $\alpha(1)$ and/or a decrease in foreign home bias, $\alpha^*(1)$. The portfolio balance locus $\dot{E} = 0$ shifts up, and the new equilibrium is associated with a higher saddle point path. The initial adjustment of E and F must again satisfy condition (6). So, the economy jumps from A to B, and then converges over time from B to C. The dollar initially appreciates, triggering an increase in the trade deficit and a deterioration of the net debt position. Over time, net debt increases, and the dollar depreciates. In the new equilibrium, the exchange rate is necessarily lower than before the shift: This reflects the need for a larger trade surplus to offset the interest payments on the now larger U.S. net debt. In the long run, the favorable portfolio shift leads to a depreciation.

Again, the degree of substitutability between assets plays an important role in the adjustment. The less substitutable U.S. and foreign assets, the higher the initial appreciation, and the larger the anticipated rate of depreciation thereafter. The more substitutable the assets, the smaller the

11. The time to adjustment is an increasing function of the degree of substitutability. In the limiting case of perfect substitutability, the depreciation is such as to achieve current account balance right away. Net debt remains constant, and so does the exchange rate.

initial appreciation, and the smaller the anticipated rate of depreciation thereafter.

The characterization of the equilibrium and the dynamic effects of preference shifts yield three main conclusions:

- Shifts in preferences towards foreign goods lead to an initial depreciation, followed by further anticipated depreciation. Shifts in preferences towards U.S. assets lead to an initial appreciation, followed by an anticipated depreciation.
- The empirical evidence suggests that both types of shifts have been at work in the recent past in the United States. The first shift, by itself, would have implied a steady depreciation in line with increased trade deficits, while we observed an initial appreciation. The second shift can explain why the initial appreciation has been followed by a depreciation. But it attributes the increase in the trade deficit fully to the initial appreciation, whereas the evidence is of a large adverse shift in the trade balance even after controlling for the effects of the exchange rate.[12]
- Both shifts lead eventually to a steady depreciation, a lower exchange rate than before the shift. This follows from the simple condition that higher net debt, no matter its origin, requires larger interest payments in steady state, and thus a larger trade surplus. The lower the degree of substitutability between U.S. and foreign assets, the higher the expected rate of depreciation along the path of adjustment. We appear indeed to have entered this depreciation phase in the United States.

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12. This does not do justice to an alternative, and more conventional monetary policy explanation, high U.S. interest rates relative to foreign interest rates at the end of the 1990s, leading to an appreciation, followed since by a depreciation. Relative interest rate differentials seem too small to explain the movement in exchange rates, but this needs to be explored more precisely.

3.3 Back to numbers

The process of adjustment to a shift, and the size of the initial exchange rate adjustment both depend on the degree of substitutability between U.S. and foreign assets, something we know little about in practice.[13] The steady state however does not. This again allows us to do a number of simple exercises.

Consider for example, a shift in preferences towards U.S. assets. From Figure 2b, it follows that the initial appreciation is bounded from above by point D. From equation (2), the upper bound is given by

$$\frac{dE/E}{d\alpha} = \frac{X + X^*/E}{X^*/E} \frac{1}{(1-\alpha)}$$

So, given the values of the variables given earlier, an increase in $\alpha(1)$ of 1 percentage point may lead to an appreciation of up to 7%. The more inelastic the shares, the stronger the appreciation.

What about the long run depreciation and increase in net debt? Table 2 shows the steady state effects of symmetric increases in $\alpha(1)$ and decreases in $\alpha^*(1)$, each by 1 percentage point. The parameters are chosen to roughly fit the data, and imply an initial steady state value of $F_0 = 0$ and $E_0 = 1$. They are listed under the table.

13. The empirical findings by Gourinchas and Rey [2004] that the U.S. net debt position helps predict the rate of change of the dollar exchange rate is consistent with the implications of our model under imperfect substitutability. Their empirical estimate may give a way of indirectly estimating the degree of substitutability between U.S. and foreign assets. We have not yet explored this connection.

Table 2. Effects of a shift in portfolio preferences

r	θ	F/X	E/E_0
0.01	0.7	0.12	0.80
0.00	0.7	0.08	0.85
0.02	0.7	0.24	0.67
0.01	0.5	0.38	0.56
0.01	0.9	0.08	0.86

($d\alpha = -d\alpha^* = 1$ percentage point. Other parameters: $\alpha(1)_0 = \alpha^*(1)_0 = 0.75, X = X^* = 1, r^* = r$)

The first line of the table gives a benchmark. We think of r as equal to the interest rate minus the growth rate, and choose it equal to 1%. We assume θ (the derivative of the ratio of the trade balance to GDP with respect to a proportional change in the exchange rate) to be equal to 0.7. In this benchmark, the steady state effect of a shift in shares by one percentage point is an increase in the ratio of net debt to assets of 12% (equivalently, 36% of GDP), and a 20% depreciation.

The second and third lines show the effects of lower or higher interest rates. In the second line, $r = 0$, so that higher net debt does not require a larger trade surplus. The accumulation of assets is smaller, and so is the depreciation. The third line, the higher interest rate leads to a much larger net debt position and a larger required depreciation. Values of r above 2.5% lead to instability: The effect of higher net debt dominates the effects of the depreciation on the trade deficit.

The last two lines show the effects of different responses of the trade balance to the exchange rate—different values of θ. In the first, the response of the trade balance as a ratio to GDP is 0.5, instead of 0.7 in the benchmark. The steady state effect is much larger net debt accumulation, and a much

larger depreciation. In the second, the response is assumed to be 0.9, and the effects on net debt and the exchange rate are much smaller.

If the degree of substitutability of U.S. and foreign assets is high, it may take a long time to get to the steady state, so we do not want to overemphasize the steady state results. But we see the basic lesson as straightforward. The forces leading to a return to current account balance are weak, and it may take a long time, a large increase in net debt, and by implication a large depreciation of the dollar.

4 Scenarios

If we think of the saddle point paths in Figure 2a or Figure 2b as giving the path of the dollar and net debt in the absence of further, unexpected, shifts, our analysis suggests slow but steady dollar depreciation for a long time to come. The continuing increase in net debt implies that the eventual depreciation will have to be substantially larger than the depreciation which would lead to a sustainable current account today—the computation we went through in Section 2.

Can these forecasts be wrong? Obviously yes. There can be both good and bad news, and we now discuss a few such scenarios (All these scenarios are obviously already reflected in the current exchange rate, but with probability less than one).

4.1 Unambiguously Good News. A Favorable Shift in z?

The only news that would be unambiguously good for both the dollar and the current account deficit would be a decrease in z, i.e. decreases in the trade deficit at a given exchange rate.

To get a sense of where these shifts may come from, it is useful to identify the sources of the deterioration of the U.S. trade deficit, controlling for the exchange rate, over the last decade.

Some have argued that the shift has come mostly from faster growth in the United States relative to its trade partners, leading imports to the United States to increase faster than exports to the rest of the world. This appears however to have played a limited role. Europe and Japan indeed have had lower growth than the United States (45% cumulative growth for the United States from 1990 to 2004, 29% for the Euro Area, 25% for Japan), but they account for only 35% of U.S. exports, and other U.S. trade partners have grown as fast or faster as the United States. A study by the IMF [2004] finds nearly identical growth rates for the United States and its trade–weighted partners since the early 1990s.[14]

Some have argued that the deterioration in the trade balance does not reflect a shift in z, but is instead the result of sustained U.S. growth together with a high U.S. import elasticity (1.5 or higher). Under this view, high U.S. growth has led to a more than proportional increase in imports, and an increasing trade deficit. The debate about the correct value of the U.S. import elasticity is an old one, dating back to the estimates by Houthakker and Magee [1969]; we tend to side with the recent conclusion by Marquez [2000] that the elasticity is close to one. For our purposes however, this discussion is not relevant. Whether the evolution of the trade deficit is the result of a shift in z or the result of a high import elasticity, there are no obvious reasons to expect either the shift to reverse, or growth in the United States to drastically decrease in the future.[15]

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14. In the forecasting macroeconomic model used by "Global Insight", shifts and unexplained time trends account for $125 billion of the $327 billion increase in the non petroleum trade deficit from 1998:1 to 2004:3, so about 40% of the increase; activity and exchange rate effects account for the rest. (We are indebted to Nigel Gault for running a simulation of the model and generating these numbers.)

15. The fact that a substantial proportion of the increase in the trade deficit is due to

Even if the slowdown in Europe and Japan has played a small role, one can still ask how much an increase in growth in Europe would reduce the U.S. trade deficit. A simple computation is as follows. Suppose that Europe and Japan made up the 15% growth gap they have accumulated since 1990 vis a vis the United States—an unlikely scenario in the near future—and so U.S. exports to Western Europe and Japan increased by 15%. Given that U.S. exports to these countries account for about 350 billion, the improvement would be 0.5% of U.S. GDP—not negligible, but not major either.

All other scenarios imply either good news for the dollar (but bad news for the current account, and net debt), or bad news for the dollar (but good news for the current account and net debt accumulation). Let's look at a few.

4.2 Good News for the Dollar? Further Shifts in Portfolio Preferences

At a given exchange rate, today's U.S. current account deficit implies a steady increase in the share of U.S. assets in U.S. and foreign portfolios. Assuming for example a growth rate for U.S. and foreign assets of 4% a year, and assuming that α remains constant, a current account deficit of about \$600 billion requires an increase in $(1-\alpha^*)$ of about two percentage points a year.

Some have suggested that the United States can continue to finance current account deficits at the current level for a long time to come, at the same exchange rate and same expected rate of return. In other words, they argue that foreign investors will be willing to further increase $(1-\alpha^*(1))$, and/or

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shifts in the export and import relations sheds doubt on the proposition that the trade deficit is mostly due to the budget deficit. The effect of the budget deficit on the trade balance should show up through the effects of either high activity or an appreciated exchange rate in the export and import relations, not through shifts in those relations.

that domestic investors will be willing to further increase $\alpha(1)$ (for example, Caballero et al [2004]). Nothing is impossible, although the opposite—a shift away from U.S. assets, at least by central banks—at this point seems to us more likely.

In any case, as we have seen, the relief would only be temporary. The shift in preferences would limit the depreciation or even lead to an appreciation of the dollar for some time. The appreciation, and the accompanying loss of competitiveness, would speed the accumulation of foreign debt however. The long run value of the dollar would be even lower.

4.3 Good News for the Dollar? Higher U.S. Interest Rates

Some have suggested that increases in U.S. interest rates may be sharper than markets currently anticipate, and so may stop or reverse the depreciation of the dollar.

To discuss this possibility, we can use our model, allowing r to be different from r^*. In this case, and taking the continuous time limit, the portfolio and current account balance equations are given by

$$X = \alpha(R)(X - F) + (1 - \alpha^*(R)(\frac{X^*}{E} + F)$$

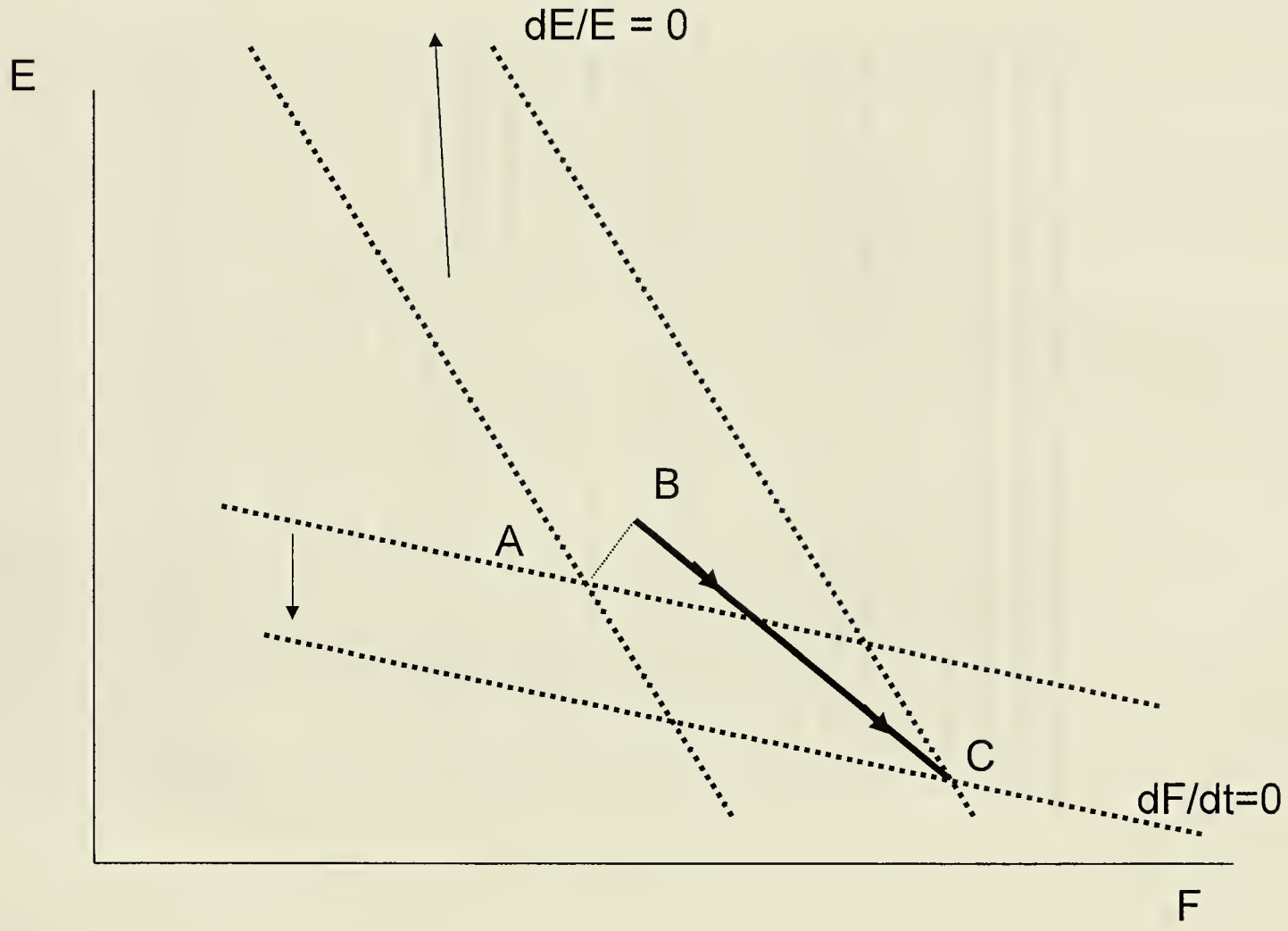
$$\dot{F} = rF + (1 - \alpha(R))(r - r^* - \frac{\dot{E}}{E})(X - F) + D(E)$$

where $R - 1 \equiv (r - r^* + \dot{E}^e/E)$.

Figure 3 shows the effects of an increase in r keeping r^* constant, starting from steady state and a positive net debt position.[16] An increase in r has two effects:

16. Under perfect substitutability, the U.S. and foreign interest rates must be equal for the economy to be in steady state. Under imperfect substitutability, the two interest rates can differ even in steady state.

Figure 3. Adjustment of the exchange rate and the net debt position to an increase in the U.S. interest rate



- It shifts the $\dot{E} = 0$ locus up: The increased return on U.S. assets increases the demand for U.S. assets and leads to an appreciation.
- It shifts the $\dot{F} = 0$ locus down, for two reasons.
  The first is that the United States now has to pay higher interest payments on its net debt position. This effect is equal to zero if net debt is initially equal to zero.
  The second is that the United States has to pay higher interest payments on its gross liabilities, $(1-\alpha)(X-F)$. This effect is present even if net debt is equal to zero.

The result of the shifts is shown in Figure 3, which also shows the saddle point path and the adjustment path. As drawn, the exchange rate appreciates, but, in general, the initial effect on the exchange rate is ambiguous: If gross liabilities are large for example, then the effect of higher interest payments on the current account balance may well dominate the more conventional effects of increased attractiveness and lead to an initial depreciation rather than an appreciation.

In any case, the steady state effect is higher net debt accumulation, and thus a larger depreciation than if r had not increased. Good initial news on the dollar is again bad news for the dollar and for net debt in the long run.

If the purpose is to limit the eventual dollar depreciation, then the right monetary policy is actually to decrease interest rates, so as to have a larger depreciation in the short run, and a smaller depreciation in the long run. In order to achieve the corresponding increase in saving, such a policy must be accompanied by a reduction of the budget deficit, so as to maintain output at its natural level.

4.4 Bad News for the Dollar? Asian Central Banks

Much of the recent accumulation of U.S. assets has taken the form of accumulation of reserves by the Japanese and the Chinese central banks. Many worry that this will not last, that the pegging of the renminbi will come to an end, or that both central banks will want to change the composition of their reserves away from U.S. assets, leading to further depreciation of the dollar.

Our model provides a simple way of discussing the issue. Consider pegging first. Pegging means that the foreign central bank buys dollar assets so as keep $E = \bar{E}$.[17] Let B denote the reserves (i.e the U.S. assets) held by the foreign central bank, so

$$X = B + \alpha(1)(X - F) + (1 - \alpha^*(1)(\frac{X^*}{E} + F)$$

The dynamics under pegging are characterized in Figure 4. Suppose that, in the absence of pegging, the steady state is given by point A, and that the foreign central bank pegs the exchange rate at level $\bar{E}$. As $\bar{E}$ is such that the U.S. current account is in deficit, F increases over time. Wealth gets steadily transfered to the foreign country, so the private demand for U.S. assets steadily decreases. To keep E unchanged, B must increase further over time. Pegging by the foreign central bank is thus equivalent to a continuous outward shift in the portfolio balance schedule: What the foreign central bank is effectively doing is keeping world demand for U.S. assets unchanged by offsetting the fall in private demand. Pegging leads to a steady increase in U.S. net debt, and a steady increase in reserves offsetting the steady decrease in private demands for U.S. assets. This path is represented by the path DC in Figure 4.

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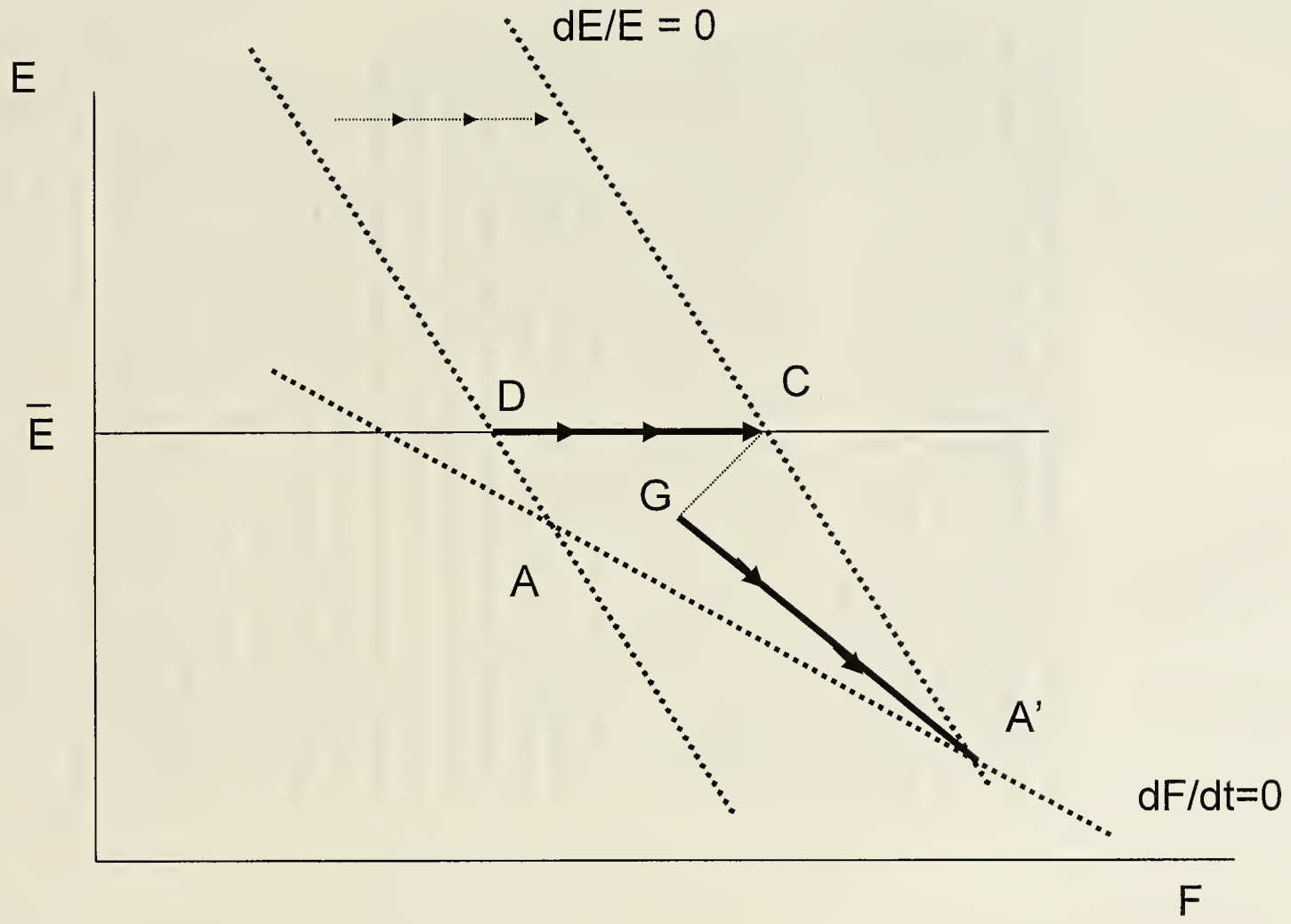
17. Our two-country model has only one foreign central bank, and so we cannot discuss what happens if one foreign bank pegs and the others do not. The issue is however relevant in thinking about the joint evolutions of the dollar–euro and the dollar–yen exchange rates. More on this below.

Figure 4. Adjustment of the exchange rate and the net debt position to the end of pegging.



What happens when the foreign central bank (unexpectedly) stops pegging? The adjustment is represented in Figure 4. With the economy at point C just before the abandon of the peg, the economy jumps to G (recall that valuation effects lead to a decrease in net debt when there is an unexpected depreciation), and the economy then adjusts along the saddle point path DA'. The longer the peg lasts, the larger the initial and the eventual depreciation.

In other words, an early end to the Chinese peg will obviously lead to a depreciation of the dollar (an appreciation of the renminbi). But the sooner it takes place, the smaller the required depreciation, both initially, and in the long run. Put another way, the longer the Chinese wait to abandon the peg, the larger the eventual appreciation of the renminbi.

The conclusions are very similar with respect to changes in the composition of reserves. We can think of such changes as changes in portfolio preferences, this time not by private investors but by central banks, so we can apply our earlier analysis directly. A shift away from U.S. assets will lead to an initial depreciation, leading to a lower current account deficit, a smaller increase in net debt, and thus to a smaller depreciation in the long run. Put another way, the longer the Chinese wait to diversify their reserves, the larger the eventual appreciation of the renminbi.

How large might these shifts be? Chinese reserves are currently equal to 500 billion, Japanese reserves to 850 billion. Assuming that these reserves are now held in dollars and the PBC and the BOJ were to reduce their dollar holdings to half of their portfolio, this would represent a decrease in the share of U.S. assets in foreign (private and central bank) portfolios, $(1-\alpha^*)$, from 30% to 28%. The computations we presented earlier suggest that this is a substantial shift.

4.5 The Euro, the Yen, and the Renminbi

We have focused so far on the dollar depreciation. However a central issue is how much of this depreciation is likely to be distributed against the euro, the yen, the renminbi, and other currencies.

To do so formally requires extending our model to (at least) three countries. We have started to do this, but we are not yet there. Here are some remarks and speculations.

- Along the adjustment path, what matters is the reallocation of wealth across countries, and thus the bilateral current account balances of the United States vis a vis its partners. Because of home bias, wealth transfers modify the relative world demands for assets, thus requiring corresponding exchange rate movements.
  Since the current U.S. deficit is mostly with Asia, this suggests that what will matter most are the asset preferences of Asian investors—both private and official, governments and central banks—relative to U.S. investors. Home bias implies that the transfer of wealth to China and Japan will lead to an appreciation of Asian currencies vis a vis the dollar. What happens to the euro depends on the relative preferences of U.S. and Asian investors vis a vis the euro. If we assume that they are roughly similar, then the demand for euro assets will remain roughly the same. This suggests that, along the adjustment path, the dollar will depreciate most against Asian currencies, less so against the euro.

  This smooth adjustment path is likely to be disturbed by the shocks we considered in the various scenarios earlier. What happens to the euro, the yen and the renminbi depends on the scenario.

- If, for example, the main alternative to the U.S. bonds market is the euro bond market, then in response to a shift away from U.S.

bonds, the dollar will depreciate more vis a vis the euro than vis a vis the yen.

- If the PBC stops pegging the renminbi to the dollar, then the obvious implication is that the renmimbi will appreciate. The more interesting question is what will happen to the dollar vis a vis the euro.

  It is often asserted that the recent appreciation of the euro vis a vis the dollar is (at least in part) the side-effect of the Chinese peg, which has shifted all the pressure onto the euro-dollar rate. Let the renminbi float and the pressure on the euro will fade away. We think this argument is simply wrong.

  Suppose that the PBC stops pegging, but leaves capital controls in place. If private Chinese investors cannot replace the PBC, the Chinese current account will have to be balanced. If this is the case, the world distribution of assets will shift away towards investors who have less of a preference for dollars, and more of a preference for euros and yens than the PBC (the PBC behaves like a private investor with an extreme preference for dollars. Most private investors have less extreme preferences). The euro and the yen will therefore appreciate vis a vis the dollar—although what happens to either the multilateral yen or euro exchange rate is a priori ambiguous; this depends on the composition of trade of Europe, and of Japan.

  Suppose that, as the PBC stops pegging, capital controls are also removed, so private Chinese investors can replace, at least in part, the PBC. The implications are the same as before: Private Chinese investors are likely to want to hold at least some of their foreign assets in euro and yen assets. Thus, the euro and the yen will appreciate vis a vis the dollar.

  Suppose that the PBC continues to peg the renminbi, but decides

to change the composition of its reserves away from dollars. Then, the same argument applies (and also applies to a similar change, if implemented by the BOJ). The relative demand for euro and yen assets will increase, leading to an appreciation of both the euro and the yen vis a vis the dollar.

5 Conclusions

We have offered a simple model to organize thoughts about the U.S. current account deficit and the dollar.

From a methodological viewpoint, the model allows for imperfect substitution and valuation effects. The relevance of valuation effects has recently been emphasized in a number of papers: The explicit integration of valuation effects in a model of imperfect substitutability is, we believe, novel.

From an empirical viewpoint, we have looked at numbers, shifts, and implications. The bottom line is that more dollar depreciation is to come.

A further shift in investors' preferences towards dollar assets would provide only temporary relief for the dollar. It would lead to an initial appreciation, but the accompanying loss of competitiveness would speed up the accumulation of foreign debt. The long run value of the dollar would be even lower. Thus the argument that the United States, thanks to the attractiveness of its assets, can keep running large current account deficits with no effect on the dollar, appears to overlook the long run consequences of a large accumulation of external liabilities.

For basically the same reason, an increase in interest rates would be self defeating. It would temporarily strengthen the dollar, but eventually the depreciation needed to restore equilibrium in the current account would be even larger–both because (as in the case of a shift in portfolio preferences)

the accumulation of foreign liabilities would accelerate, and because eventually the U.S. would need to finance a larger flow of interest payments abroad–because both interest rates and debt would be higher. A much better mix would be a decrease in interest rates, and a reduction in budget deficits to avoid overheating. (To state the obvious: Tighter fiscal policy is needed to reduce the current account deficit, but is not a substitute for the dollar depreciation. Both are needed.)

A number of bad news could hit the dollar. The most likely is a decision by Asian central banks to stop buying dollars, or to rebalance their portfolios reducing the share of reserves held in the form of dollar assets. Our numbers suggest that such a rebalancing would represent a significant shift in world demand for dollar assets.

The end of the Chinese peg would be bad news for the dollar. Contrary to a view commonly held in Europe, it might be bad news for Europe as well: The Euro is likely to further appreciate vis a vis the dollar. The reason is that an investor with extreme preferences for dollar assets–the PBC–would exit the market.

We end with one more general remark. A large fall in the dollar is not by itself a catastrophy for the United States. By itself, it leads to higher demand and higher output, and it offers the opportunity to reduce budget deficits without triggering a recession. The danger is much more serious for Japan and Western Europe. While the appropriate response to a euro or yen appreciation, given their current position, should be looser money and possibly looser fiscal policy as well, their room for macroeconomic maneuver is very limited. Interest rates are already low, and deficits relatively high. The dollar depreciation is certain to create more problems in Europe and Japan than in the United States.

References

[1] Caballero, R., Farhi, E., and Hammour, M., 2004, Speculative growth: Hints from the U.S. economy, mimeo, MIT.

[2] Chinn, M., 2002, Doomed to deficits? Aggregate U.S. trade flows re-examined, mimeo, U.C. Santa Cruz and NBER.

[3] Dornbusch, R., 1976, Expectations and exchange rate dynamics, *Journal of Political Economy* **84**, 1161–1176.

[4] Gourinchas, P.-O. and Rey, H., 2004, International financial adjustment, mimeo, Berkeley.

[5] Henderson, D. and Rogoff, K., 1982, Negative net foreign asset positions and stability in a world portfolio balance model, *Journal of International Economics* **13**, 85–104.

[6] Hooper, P., Johnson, P., and Marguez, J., 2001, Trade elasticities for the G7 countries, *Princeton Studies in International Finance* 87.

[7] Houthakker, H. and Magee, S., 1969, Income and price elasticities in world trade, *Review of Economics and Statistics* **51(1)**, 111–125.

[8] International Monetary Fund, 2004, U.S. selected issues, *Article IV United States Consultation-Staff Report.*

[9] Kouri, P., 1976, Capital flows and the dynamics of the exchange rate, Seminar paper 67, Institute for International Economic Studies, Stockholm.

[10] Kouri, P., 1983, Balance of payments and the foreign exchange market: A dynamic partial equilibrium model, pp. 116–156, in *Economic Interdependence and Flexible Exchange Rates*, J. Bhandari and B. Putnam eds, MIT Press, Cambridge, Mass.

[11] Lane, P. and Milesi-Ferretti, G., 2004, Financial globalization and exchange rates, *NBER Macroeconomics Annual* pp. 73–115.

[12] Marquez, J., 2000, The puzzling income elasticity of U.S. imports, mimeo, Federal Reserve Board.

[13] Obstfeld, M. and Rogoff, K., 2004, The unsustainable U.S. current account revisited, 10869, NBER Working Paper.

[14] Ventura, J., 2003, Towards a theory of current accounts, *The World Economy*.

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